

# **Stratus<sup>®</sup> ftServer<sup>®</sup> T40 AC and T65 AC Systems: Site Planning Guide**

Stratus Technologies  
R595-00

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# Preface

The *Stratus ftServer T40 AC and T65 AC Systems: Site Planning Guide* (R595) documents the site requirements and customer responsibilities related to preparing a site for the installation of ftServer T40 AC and T65 AC systems.

This manual is intended for those responsible for preparing a site for the installation of an ftServer T40 AC or T65 AC system.

## Revision Information

This is the first edition of this manual.

## Notation Conventions

This document uses the notation conventions described in this section.

## Warnings, Cautions, and Notes

Warnings, cautions, and notes provide special information and have the following meanings:



### **WARNING** \_\_\_\_\_

A warning indicates a situation where failure to take or avoid a specified action could cause bodily harm or loss of life.



### **CAUTION** \_\_\_\_\_

A caution indicates a situation where failure to take or avoid a specified action could damage a hardware device, program, system, or data.

### **NOTE** \_\_\_\_\_

A note provides important information about the operation of an ftServer system.

## Typographical Conventions

The following typographical conventions are used in this document:

- The bold font emphasizes words in text. For example:  
**Before** handling or replacing system components, make sure that you are properly grounded by using a grounded wrist strap.
- The italic font introduces new terms. For example:  
Many hardware components are *customer-replaceable units* (CRUs), which can be replaced on-site by system administrators with minimal training or tools.

## Getting Help

If you have a technical question about ftServer system hardware or software, try these online resources first:

- **Online documentation at the StrataDOC Web site.** Stratus provides complimentary access to StrataDOC, an online-documentation service that enables you to view, search, download, and print customer documentation. You can access StrataDOC at the following Web site:

<http://stratadoc.stratus.com>

A copy of the StrataDOC CD-ROM for your system is included with this release. To order additional copies of the StrataDOC CD-ROM or to obtain copies of printed manuals, do one of the following:

- If you are in North America, call the Stratus Customer Assistance Center (CAC) at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week.
- If you are outside North America, contact your nearest Stratus sales office, CAC office, or distributor; see <http://www.stratus.com/support/cac/index.htm> for CAC phone numbers outside the U.S.
- **Online support from Stratus Customer Service.** You can find the latest technical information about an ftServer system through online product support at the [Stratus Technical Support Web site](#):

<http://www.stratus.com/support/technics.htm>

If you are unable to resolve your questions with the help available at these online sites, and the ftServer system is covered by a service agreement, please contact the [Stratus Customer Assistance Center \(CAC\)](#) or your authorized [Stratus service representative](#). For information about how to contact the CAC, see the following Web site:

<http://www.stratus.com/support/cac/>

## Commenting on the Documentation

To provide corrections and suggestions on the documentation, send your comments in one of the following ways:

- By clicking the **site feedback** link at the bottom of a Help topic. Information to identify the topic is supplied in the StrataDOC Web Site Feedback form.
- By email to [Comments@stratus.com](mailto:Comments@stratus.com). If it is possible, please include specific information about the documentation on which you are commenting:
  - For a printed document or a document in PDF format, include the title and part number from the Notice page and the page numbers.
  - For online documentation, include the Help subject and topic title.

This information will assist Stratus Information Development in making any needed changes to the ftServer system documentation. Your assistance is most appreciated.

## Regulatory Notice

All regulatory notices are provided in [Appendix C, “Standards Compliance.”](#)



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# Chapter 1

## Welcome to Site Planning for ftServer T40 AC and T65 AC Systems

For an overview of the information you need to know and of the tasks you need to perform to prepare a site for ftServer T40 AC and T65 AC systems, see:

- [“Site Planning Overview”](#) on page 1-1
- [“Site Planning for Fault-Tolerant Systems”](#) on page 1-2
- [“Site Planning Checklist”](#) on page 1-3
- [“System Documentation”](#) on page 1-6

### Site Planning Overview

[Site planning for fault-tolerant systems](#) includes:

- [Space planning](#)

Provide adequate space for the system or cabinet and for a desk or table to accommodate components outside a cabinet. Also provide enough space for servicing the systems and components.

Provide an environment that meets the system's requirements for ambient temperature and air quality.

- [Purchasing an appropriate cabinet and monitor](#)

If you do not purchase a monitor from Stratus, provide a monitor that meets the system's requirements.

If you do not purchase a cabinet from Stratus, provide a cabinet that meets the system's requirements.

- [Electrical \(AC\) power planning](#)

Provide electrical AC power sources that meet the requirements of the system and optional components.

- [Network and telephone line planning](#)

Provide sufficient network and analog telephone lines.

- [Rack space planning](#)

Ensure that the power distribution units (PDUs) supply sufficient power to the components you have purchased and that you have sufficient space available in an appropriate cabinet.

Use the “[Site Planning Checklist](#)” on [page 1-3](#) to track your site preparation progress.

For a list of other documents related to your ftServer system, see “[System Documentation](#)” on [page 1-6](#).

During the site planning and preparation processes, work closely with your facilities group or contractor to determine space, power, and environmental requirements. Enlist their help to provide a suitable location with sufficient alternating current (AC) power, heating, ventilation and air conditioning (HVAC) capabilities, and network and telephone connections.

If your system is covered by a service agreement and you need help with site planning, contact the Stratus Customer Assistance Center (CAC) or your authorized Stratus service representative. If you have a contract with the CAC or your authorized Stratus service representative to install the system, contact them after you have prepared the installation site and moved the system to the site. For more information about the CAC, see [Getting Help](#) in the Preface or the [CAC Web site](#) at:

<http://www.stratus.com/support/cac/>

See [Appendix A, “System Specifications”](#) for the specifications of your ftServer system and the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for specifications of other components.

## Site Planning for Fault-Tolerant Systems

Consider the following specific fault-tolerant features of ftServer systems for site planning:

- *Lockstep technology* means that the systems contain redundant hardware. The systems contain two enclosures, each containing a full computing environment that consists of a CPU element and an I/O element.

If a component in a CPU element malfunctions, the corresponding CPU element in the other enclosure, which is processing the same information in *lockstep*, continues processing without interruption. If a component in the I/O element malfunctions, the system fails operation over to the corresponding element in the other enclosure and continues to operate normally. The only consequences are that the system is less fault tolerant, and any I/O throughput distributed between the enclosures may be reduced. To restore full fault tolerance, an enclosure can be replaced without taking the system offline.

- ftServer systems can connect to the Stratus ActiveService Network (ASN).

Connecting a system to the ASN allows the CAC or your authorized Stratus service representative to remotely diagnose, troubleshoot, and resolve problems online.

To enable connectivity to the ASN, a modem can be attached directly to the system and managed by system software.

## Site Planning Checklist

Referring to the information in this document, answer the following questions:

### Planning for ASN Connectivity

- Will your system use an ASN modem or the Internet to connect to the ASN?
- If your system will use the Internet, do you have an Internet connection available for the system?
- If your system will use an ASN modem, do you have an external analog telephone line available for the ASN modem?

#### NOTE \_\_\_\_\_

A dedicated phone line provides the most reliable service. ASN calls routed through a PBX may be slow due to load on the PBX, or may not complete successfully due to disconnections. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.

- Do you have an additional telephone line and telephone near the operator's station for voice communications when calling for support?

### Planning for SINAP/SS7

- If you are connecting a U928 Four-Port T1/E1 PCI Adapter to a T1, E1, or J1 line, do you have a channel service unit/data service unit (CSU/DSU)? For more information about planning for a U928 PCI adapter, see the *Stratus ftServer Systems: PCI Adapter Guide* (R461).

### Planning for Optional Components

- The system contains four 10/100/1000 megabits-per-second (Mbps) Ethernet ports. Will your system additionally include any of the following PCI adapters for network communications? If so, indicate the total number of ports, and plan network connections for all Ethernet ports you will use.

**Table 1-1. Ethernet PCI Adapters**

Adapter	Number of Ports
U574 Dual-Port Fiber Gigabit Ethernet Adapter	
U575 Dual-Port Copper Gigabit Ethernet Adapter	

- Will your system connect to any storage enclosures? If so, the system requires a pair of PCI adapters, which are provided when you order the storage enclosure. If you order the enclosure at the same time you order the system, the required PCI adapters are installed at the factory. See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for a list of the supported storage enclosures, descriptions of the storage enclosures, and the names of the required PCI adapters.
- Will you supply your own monitor or will Stratus supply the monitor? Is the monitor rack-mountable or do you need to provide a table or desk?

**NOTE** \_\_\_\_\_

Use the USB keyboard and mouse supplied by Stratus.

- Will your system include any tape drives? The tape drives supplied with your system are rack-mountable. If you order the tape drive at the same time you order the system, the required PCI adapters are installed in the system. See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for a list of the supported tape-drive enclosures, descriptions of the tape-drive enclosures, and the names of the required PCI adapters.

### Planning AC Power

- Will you provide power through a PDU?
- What optional components will you use?
- What are the AC power requirements of your system, including all optional components?
- What are the lengths and types of the power cords that are provided for the system and optional components?
- What type of AC receptacles do you need to provide?
- Is the AC power service wired properly?

## Planning Space for Your System

- Will your system and its external components fit where you plan to place them?
- If you are rack-mounting the system, what is the height of the cabinet you will use and what is the total height of the systems and components that will be installed in the cabinet? Will the items fit into the cabinet? What components will be located outside the cabinet?
- What are the lengths and types of the interface and communications cables that will connect to your system?
- Have you created a sketch of how you plan to arrange the system at the installation site? Consider the available cable lengths, the placement of external devices, and the location of network and voice communication connections.

On the sketch, show the following:

- Location of the system and its external components
- Power cords, and telephone and interface cables
- Locations of AC power receptacles, phone jacks, Ethernet jacks, switches, and/or hubs

### NOTE

Make sure that all cords and cables are long enough to reach between their respective components and connectors. Route all cables out of the way of foot traffic.

## Working with Other Groups

- Have you provided your facilities group and contractors with the sketch and copies of the following?
  - [“AC Power Service Requirements” on page 4-2](#)
  - Tables [4-1](#), [4-2](#), and [4-3](#), worksheets for determining AC power requirements
  - Tables [4-4](#) and [4-5](#) (if you are using PDUs) or Tables [4-6](#) and [4-7](#) (if you are not using PDUs), worksheets for determining the number of external power outlets required
  - [Appendix B, “Electrical Circuit and Wiring Information”](#)
  - Any notes you have about site planning
- Have you reviewed and discussed the requirements with the facilities personnel and contractors to ensure that all site modifications are understood and implemented?

If you have any questions about the number and types of components, contact your Stratus account executive or distributor.

## System Documentation

When you receive your system, you receive a printed copy of the installation guide and warranty for your system and the full system documentation set on CD-ROM.

You can order additional copies of the ftServer T Series StrataDOC CD-ROM (part number R003LCDK).

To order documentation, customers in North America can call the CAC at (800) 221-6588 or (800) 828-8513, 24 hours a day, 7 days a week. Customers outside North America can contact the nearest Stratus Sales office, CAC office, or distributor.

Stratus provides complimentary access to StrataDOC at the following Web site:

<http://stratadoc.stratus.com>

Table 1-2 lists ftServer T40 AC and T65 AC system documents and the tasks described in each document.

**Table 1-2. ftServer T40 AC and T65 AC Documentation**

Document	Task
<i>Stratus ftServer T40 AC and T65 AC Systems: Site Planning Guide (R595)</i>	Prepare a site for installation of your ftServer system
<i>Stratus ftServer Systems: Peripherals Site Planning Guide (R582)</i>	Find information about optional equipment that you have ordered with your system that is needed to complete site preparation
<i>Stratus ftServer T40 AC and T65 AC Systems: Installation Guide (R596)</i>	Install your system, including mounting the system in a cabinet  Find the part number of a customer-replaceable unit (CRU)  Start the system for the first time
<i>Stratus ftServer T40 AC and T65 AC Systems: Operation and Maintenance Guide (R597)</i>	Start up, shut down, and operate your system  Troubleshoot system hardware  Remove and replace CRUs
<i>Read Me First: Unpacking ftServer T40 and T65 Systems (R590)</i>	Inspect and unpack ftServer system hardware that you install in your cabinet.
<i>Stratus ftServer Systems: PCI Adapter Guide (R461)</i>	Install, configure, replace, or troubleshoot PCI adapters

**Table 1-2. ftServer T40 AC and T65 AC Documentation (Continued)**

Document	Task
<i>Stratus ftServer Systems: Technical Reference Guide (R550)</i>	Consult technical reference information for ftServer systems  Change BIOS settings
<i>Release Notes: Stratus ftServer System Software for the Linux Operating System (R005L)</i>	Learn the contents of the latest ftServer System Software release  Learn the latest information about the product  Learn about significant known problems and how to work around or avoid the problems
<i>Stratus ftServer System Administrator's Guide for the Linux Operating System (R003L)</i>	Use tools that are provided by the operating system software, ftServer System Software, and other vendors to manage the system  Use ftServer management software to administer or troubleshoot ftServer systems  Install and upgrade the Linux operating system and ftServer System Software, and BIOS and BMC firmware  Manage data storage devices  Install and configure simple network management
<i>Stratus ActiveService Network Configuration Guide (R072)</i>	Configure your system for support by the Stratus ASN



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## Chapter 2

# Cabinet and Monitor Requirements

For requirements related to providing your own cabinet and monitor, see:

- [“Cabinet Requirements” on page 2-1](#)
- [“Monitor Requirements” on page 2-4](#)

## Cabinet Requirements

If you are providing your own cabinet for an *ftServer* system, make sure the cabinet contains a rack that is 19-in. wide and that meets the Electronic Industries Association (EIA) 310-D standard.

In general, consider the following factors during your site planning for systems in cabinets:

- **Elevated Operating Ambient Temperature**—If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (T<sub>ma</sub>) specified by the manufacturer.
- **Reduced Air Flow**—Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.
- **Mechanical Loading**—Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.
- **Circuit Overloading**—Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Make sure that the cabinet meets the following requirements:

- The cabinet can support the weight of all the components you plan to install in it. Refer to [Appendix A, “System Specifications”](#) and the *Stratus ftServer Systems: Peripherals Site Planning Guide (R582)*, for the weights of components supplied by Stratus.

- The cabinet contains two front and two rear vertical EIA rails, one in each corner of the cabinet, that have the EIA **universal** square-hole pattern as defined in the EIA 310-D specification.
- The front vertical rails extend at least 0.5 in. (1.27 cm) beyond the inside edge of the accessory leg, if present, to allow the mounting rails to be fitted. See [Figure 2-1](#).
- The distance between the front vertical rails and the inside of the front door is at least 3.0 in. (7.62 cm).
- The distance between the rear of the system chassis and the inside of the rear door is at least 6.0 in. (15.24 cm).
- The distance between the front and rear vertical rails is between 24.5 in. and 30 in. (62.23 cm and 76.20 cm).
- The vertical mounting rails accept 10-32 cage nuts and mounting hardware.
- The vertical mounting rails are plated or some other method is used to ensure continuity for grounding between installed equipment.
- Cable management brackets are provided to support and constrain data and power cords so that the cables do not interfere with air flow out of the rear of the enclosures, and so that the connectors do not disconnect or break.
- The cabinet provides enough stability so that system components pass Telcordia GR-63-CORE Section 4.4 regulations for earthquake vibration (Zone 4), operation vibration, and transport vibration.
- To prevent stray voltages, all components are grounded together through the vertical mounting rails to the cabinet frame, and then to local building ground. To ensure signal quality, use a grounding cable provided by Stratus for local building ground.
- There is a plan for maintaining cables and wires to the cabinet by either running them under the floor or placing them overhead in an overhead cable tray.
- Air flows through the cabinet from front to back.
- Air does not recirculate within the cabinet.
- Filler panels cover any unused rack space to prevent air recirculation.
- Blockers are installed between the vertical mounting rails and the side panels at the rear of the cabinet.
- Vents are evenly distributed on the front and rear doors and comprise at least 63% of the surface area.

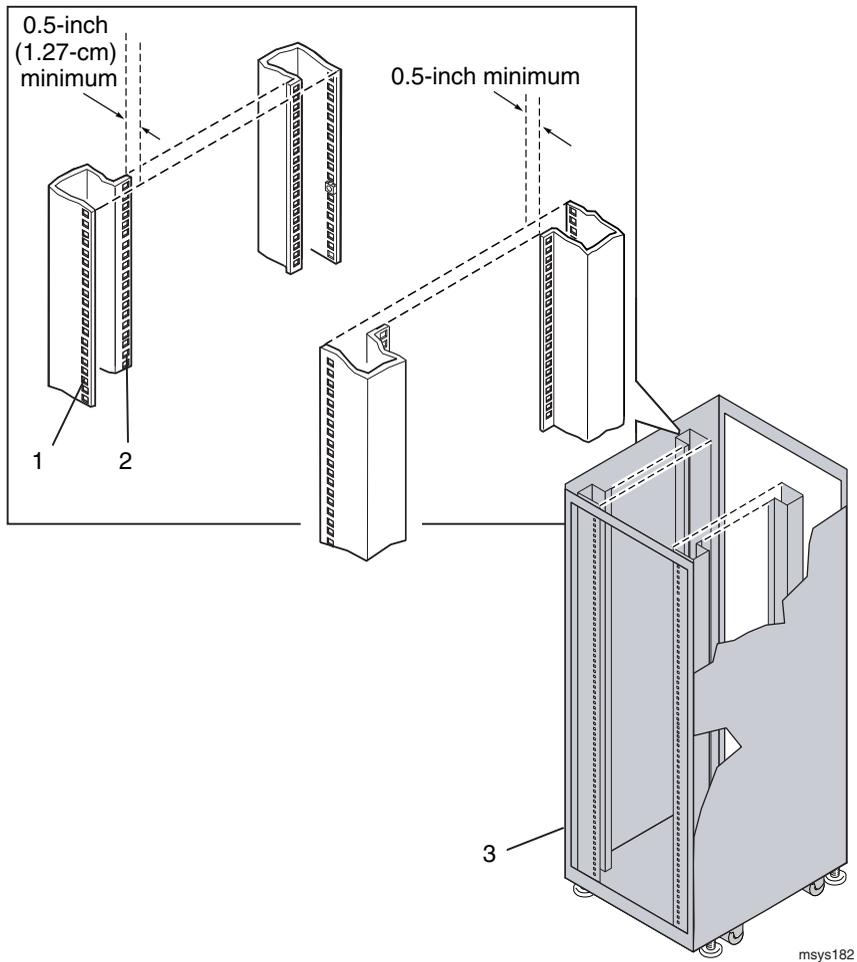
NOTE \_\_\_\_\_

If your cabinet does not have vented front and rear doors, you can remove the doors from the cabinet while your ftServer system is operating.

- The final installation conforms to all emission, immunity, safety, and other applicable regulations.

Figure 2-1 shows the required rail clearance between the front vertical rails and the inside edge of an accessory leg.

Figure 2-1. Rail Clearance



- 1 Front vertical EIA rail
- 2 Accessory leg
- 3 Front of cabinet

## Monitor Requirements

If you are using a monitor that is not supplied by Stratus, make sure that:

- The monitor accepts universal 100–240 VAC, 50/60 Hz power.
- The VGA cable has a 15-pin D-sub connector.
- The power cord for the monitor is long enough to reach the power source.
- The plug type on the power cord is compatible with the external power source at the site.

To ensure system fault-tolerance, use the keyboard and mouse provided by Stratus, which has been tested to work correctly with ftServer systems.

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## Chapter 3

# Space Planning

For information about planning sufficient space for your ftServer system, see:

- [“Room Requirements” on page 3-1](#)
- [“Planning for Cables” on page 3-2](#)

## Room Requirements

To ensure that the installation site provides a properly equipped, cooled, and sized environment, make sure that the site:

- Provides clearances for air circulation and servicing the system  
Locate the front and rear of the system at least 2.5 ft (0.76m) away from walls and other obstructions.
- Maintains reasonable temperature and humidity levels and has a thermometer and humidistat to monitor room temperature and humidity
- Is as free of dust as possible, meeting, at a minimum, ISO 14644-1 class 8 standards for a clean-room environment

Dust buildup in the system can impede air circulation and heat transfer, causing components to become less reliable as the ambient temperature rises.

Fans clogged by dust fail to expel hot air, causing circuit boards to overheat and fail.

Dust on circuit boards raises the temperature, thus reducing the component's mean time between failure (MTBF)

Dust circulating in the room increases the risk of fire within the room by providing potential combustible material within the environment

Dust contamination on tape devices causes mis-reads and -writes, leading to failure of attempts to back up and restore data.

- Provides a table or desktop for external devices such as a telephone, and an external monitor, keyboard, and mouse

- Provides cutouts in the floor for routing cables, if the site has an elevated floor



### CAUTION

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Do not place the system in an area of high electrostatic discharge. Static electricity may damage components. Do not locate components near transformers or other electromagnetic devices.

See [Appendix A, “System Specifications”](#) and *Stratus ftServer Systems: Peripherals Site Planning Guide (R582)* for the dimensions of system components.

## Planning for Cables

To accommodate cables from your system, make sure to provide:

- Two telephone lines:
  - One telephone line for use when calling for service
  - One telephone line for the ASN modem, if used
- Ethernet jacks, switches, or hubs, as needed
- Two electrically separate grounded AC wall outlets within reach of the power cords from the system or PDUs, and additional outlets for any components that do not connect to a PDU
- For optional components, AC wall outlets within reach of the power cords from the components, or use PDUs

Make sure that cables you plan to connect to the system are long enough to reach between the system and external components or connections. See the *Stratus ftServer Systems: Peripherals Site Planning Guide (R582)* for information about cable lengths for peripheral components available from Stratus.

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## Chapter 4

# Electrical Power Planning

For information about planning appropriate AC electrical power for your system and its peripheral components, see:

- [“Redundant Power Sources”](#)
- [“Grounding Requirements”](#)
- [“AC Power Service Requirements” on page 4-2](#)

### Related Topic

- [Chapter 6, “Rack Configuration Planning”](#)

## Redundant Power Sources

ftServer systems require at least two separate and independent AC power sources—an *A-side* power source and a *B-side* power source—that provide power to the system’s power receptacles, labeled, respectively, A and B. Either source must be capable of continuing to provide power if power to the other source is lost.

The A-side power source provides power to one side of each system and storage enclosure, as well as to components that do not require two sources of power, such as tape drives and a monitor. The B-side power source provides power to the other side of each system and storage enclosure.

The wattage required from the A-side power source will always be equal to or greater than the wattage required from the B-side power source.

## Grounding Requirements



### WARNING

**Incorrect grounding can cause severe personal injury and extensive equipment damage.**

The ftServer system obtains an earth reference ground over independent ground connections to the cabinet frame. Ensure that a high-integrity safety-ground conductor is installed as part of the wiring system.

See “[Grounding Considerations](#)” on page B-1 for a more complete discussion of ftServer system grounding.

## AC Power Service Requirements

From the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582), obtain the nominal input line voltage (volts AC) and frequency (Hz) required for optional, AC-powered components. In general, provide 100–240 VAC at 50 or 60 Hz for optional components. PDUs require 200–240 VAC at 50 or 60 Hz.

For detailed information about the plug types and lengths of the power cords provided with the system, see the following tables:

- For the system, [Table 4-8](#)
- For PDUs, [Table 4-9](#)
- For optional components, [Table 4-11](#)

The power service must be properly wired and grounded according to local standards and regulations. See [Appendix B, “Electrical Circuit and Wiring Information”](#) for more information.

### NOTE

Circuit breakers must provide a protective earth ground current at a maximum of 3.5 milliamperes for each AC power cord.

Use the following worksheets to determine AC power requirements for the site.

- In [Table 4-1](#), determine the power requirements at the A-side power source.
- In [Table 4-3](#), determine the power requirements for components outside of the cabinet. These components can share a power source with the A-side or B-side components.

### To determine AC power requirements

Provide information in [Tables 4-1](#), [4-2](#), and [4-3](#) as follows:

1. In the Quantity column, write the number of each type of component.
2. Multiply the entry in the Quantity column by the number in the @ Power (Watts) column, and enter the result in the AC Power (Extended) column.
3. Add the values in the AC Power (Extended) column, and enter the sum on the bottom line. This value indicates the maximum power requirement for each power source.

**Table 4-1. Worksheet for Determining A-Side Power Requirements**

System Component	Quantity		@ Power (Watts)		AC Power (Extended)
ftServer system		x	650	=	
Monitor <sup>†</sup>		x		=	
Tape drive enclosure <sup>†</sup>		x			
Storage enclosure <sup>†</sup>					
User-supplied components					
<b>TOTAL A-SIDE POWER REQUIREMENTS</b>					

† See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for the wattage of optional components you purchase from Stratus.

**Table 4-2. Worksheet for Determining B-Side Power Requirements**

System Component	Quantity		@ Power (Watts)		AC Power (Extended)
ftServer system		x	650	=	
Storage enclosure <sup>†</sup>		x		=	
User-supplied components					
<b>TOTAL B-SIDE POWER REQUIREMENTS</b>					

† See the *Stratus ftServer Systems: Peripherals Site Planning Guide* (R582) for the wattage of optional components you purchase from Stratus.

**Table 4-3. Worksheet for Determining External Power Requirements**

System Component	Quantity		@ Power (Watts)		AC Power (Extended)
Other peripheral components					
<b>TOTAL EXTERNAL POWER REQUIREMENTS</b>					

## AC Power Outlet Requirements

If you **do** use a pair of PDUs in the cabinet, use Tables 4-4 and 4-5 to determine the total number of power outlets required **outside the cabinet**.

1. In the Quantity column, write the number of each type of component.
2. Multiply the value in the Quantity column by the value in the Outlets column, and enter the total in the Subtotal column.
3. Add the values in the Subtotal column and enter the sum next to TOTAL NUMBER OF A-SIDE POWER OUTLETS and TOTAL NUMBER OF B-SIDE POWER OUTLETS.

**Table 4-4. Worksheet: A-Side External Power Outlet Requirements - PDUs Used**

Component	Quantity		Outlets	Subtotal
PDUs		x	1	
External monitor		x	1	
Other external components				
<b>TOTAL NUMBER OF A-SIDE POWER OUTLETS</b>				

**Table 4-5. Worksheet: B-Side External Power Outlet Requirements - PDUs Used**

Component	Quantity		Outlets	Subtotal
PDUs		x	1	
Other external components				
<b>TOTAL NUMBER OF B-SIDE POWER OUTLETS</b>				

If you do **not** use PDUs in the cabinet, use Tables 4-6 and 4-7 to determine the number of AC power outlets required **outside the cabinet**.

1. In the Quantity column, write the number of each type of component.
2. Multiply the value in the Quantity column by the value in the Outlets column, and enter the total in the Subtotal column.
3. Add the values in the Subtotal column and enter the sum next to TOTAL NUMBER OF A-SIDE POWER OUTLETS and TOTAL NUMBER OF B-SIDE POWER OUTLETS.

**Table 4-6. Worksheet: A-Side External Power Outlet Requirements - No PDUs**

Component	Quantity		Outlets	Subtotal
ftServer systems		x	1	
Storage enclosures		x	1	
LCD monitor units or external monitors		x	1	
Tape drives		x	1	
Other peripheral components		x		
<b>TOTAL NUMBER OF A-SIDE POWER OUTLETS</b>				

**Table 4-7. Worksheet: B-Side External Power Outlet Requirements - No PDUs**

Component	Quantity		Outlets	Subtotal
ftServer systems		x	1	
Storage enclosures		x	1	
Other peripheral components		x		
<b>TOTAL NUMBER OF B-SIDE POWER OUTLETS</b>				

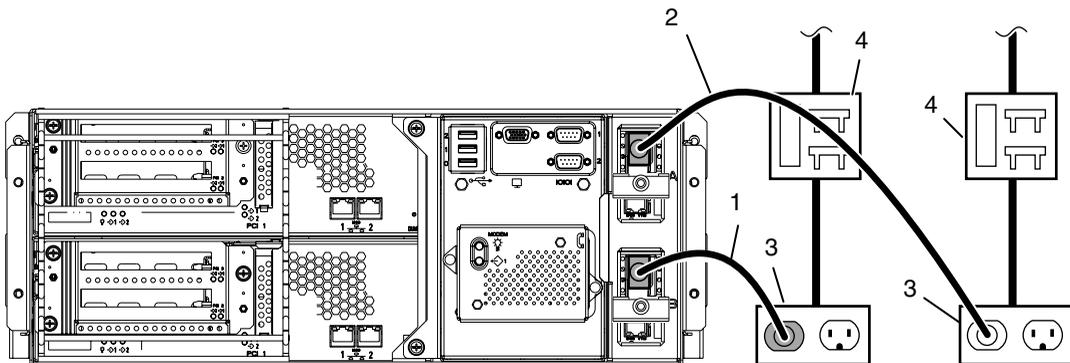
## Connecting a System Directly to Two Separate AC Power Sources

Provide two AC power sources that are as electrically independent of each other as the installation site allows.

At a minimum, the two power sources must be powered by separate circuit breakers (maximum of 20A) to AC power and, if possible, be independent of each other beyond that level. The more electrical separation between the two power sources, the less likely they will both fail at the same time. Due to redundancy in ftServer systems, power to either side of the system keeps the system in operation, although the system is no longer fault-tolerant with regard to power.

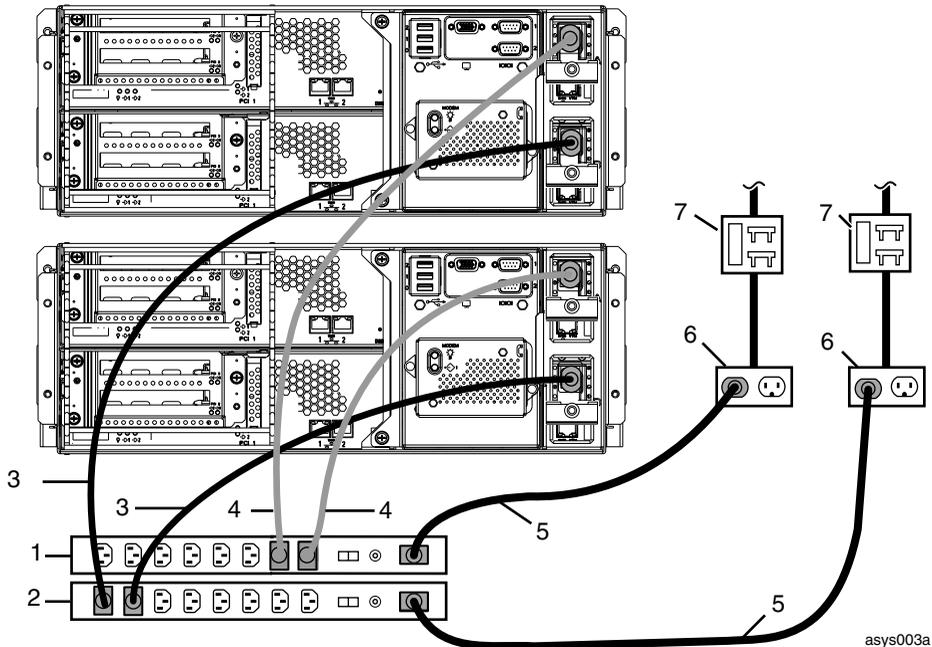
Figure 4-1 shows how to connect rack-mounted ftServer T40 AC and T65 AC systems directly to two separate AC power sources and Figure 4-2 shows how to connect PDUs directly to two separate power sources.

Figure 4-1. System Connected Directly to AC Power



- 1 B-side power cord
- 2 A-side power cord
- 3 AC power outlets
- 4 Circuit breakers (maximum of 20A)

Figure 4-2. PDUs Connected Directly to AC Power



asys003a

- 1 A-side PDU
- 2 B-side PDU
- 3 B-side jumper cables
- 4 A-side jumper cables
- 5 PDU power cords
- 6 AC power outlets
- 7 Circuit breakers (maximum of 20A)

## AC Power Cords Supplied by Stratus



### WARNING

Place all power cords out of the way of foot traffic.

Stratus supplies tested and approved AC power cords for the following components:

- [ftServer systems](#)
- [PDUs](#)
- [LCD monitor units, storage enclosures, and tape drives](#)

Stratus supplies tested and approved AC power cords for the [optional components](#) you purchase from Stratus.

Power cords described as Domestic are made with American Wire Gauge (AWG) cordage and are intended for use in North America. Refer to UL 62 and CSA C22.2, No. 49. All other power cords are made with International Harmonized cordage and are intended for use in the specified countries, and other countries that use that standard.

### System Power Cords

[Table 4-8](#) lists the available power cords for ftServer systems that connect directly to an AC power source.

**Table 4-8. System Power Cords to AC Power**

Locale	Plug Type	Rating	Length	Marketing ID
North America and Japan locking power cord	NEMA L6-20	20A/250V	15 ft (4.5m)	B50161
International, locking power cord	IEC 60309 (formerly IEC 309)	16A/250V	4.5m	B50153
North America (Chicago)	NEMA 5-15	15A/127V	7 ft	B50101
North America (domestic)	NEMA 5-15	15A/127V	15 ft	B50104
Australia	AS/NZS 3112:1993	10A/250V	4.5m	B50124
China	GB1002-1996	10A/250V	4.5m	B50162
Europe (Continental)	CEE 7 VII	16A/250V	4.5m	B50112
Israel	SI 32:1971	16A/250V	4.5m	B50132
Italy	CEI23-16	10A/250V	4.5m	B50136
Japan	NEMA 5-15	15A/127V	15 ft (4.5m)	B50160
South Africa/India	SABS164-1:1992 ZA/3	13A/250V	4.5m	B50152
Switzerland	SEV 1011-S24507	10A/250V	4.5m	B50140
United Kingdom	BS 1363/A,	13A/250V	4.5m	B50116

## PDU Power Cords

The PDU supplies power to ftServer systems. [Table 4-9](#) lists the available power cords to connect PDUs directly to an AC power source.

[Table 4-9](#) describes the gray and black power (*jumper*) cables that are provided to connect ftServer systems to PDUs.

**Table 4-9. PDU Power Cords to AC Power**

Locale	Plug Type	Rating	Length	Marketing ID
North America <sup>†</sup>	IEC 60320 (formerly 320) C19 to NEMA L6-20P	20A/250V 50–60 Hz	15 ft (4.5m)	B50155
North America and Japan <sup>†</sup>	IEC 60320 C19 to NEMA L6-30P (Receptacle must be fused at no more than 20A)	30A/250V 50–60 Hz	15 ft	B50171
International <sup>†</sup>	IEC 60320 C19 to IEC 60309	20A/250V 50–60 Hz	15 ft (4.5m)	B50154

<sup>†</sup> Use this power cord to connect the PDU directly to the AC power mains.

**Table 4-10. System Power (*Jumper*) Cables to a PDU**

Length	Rating	Plug Type to System	Plug Type to PDU	Marketing ID
2.0m	10A/250V	IEC 320 C13	IEC 60320 (formerly IEC 320) C14	B50502

## Power Cords for Optional Components

[Table 4-11](#) lists the available power cords to connect optional components directly to external AC power sources.

**Table 4-11. AC Power Cords for Optional Components**

Locale	Rating	Plug Type	Length	Marketing ID
North America and Japan	15A/120VAC	NEMA 5-15	7 ft	B50101-07
North America and Japan	15A/120VAC	NEMA 5-15	10 ft	B50102-10
United States (Domestic)	15A/127VAC	NEMA 5-15	10 ft	B50106-10
Australia	10A/250VAC	AS/NZS 3112:1993	2.5m	B50121-25M
China (CCC)	10A/250VAC	GB1002-1996	2.5m	B50162-08

**Table 4-11. AC Power Cords for Optional Components** *(Continued)*

<b>Locale</b>	<b>Rating</b>	<b>Plug Type</b>	<b>Length</b>	<b>Marketing ID</b>
Europe (Continental)	16A/250VAC	CEE 7 VII	2.5m	B50109-25M
India	13A/250VAC	SABS164-1:1992; ZA/3	2.5m	B50149-25M
Israel	16A/250VAC	SI 32:1971	2.5m	B50129-25M
Italy	16A/250VAC	CEI23-16;	2.5m	B50133-25M
New Zealand	10A/250VAC	AS/NZS 3112:1993	2.5m	B50121-25M
South Africa	13A/250VAC	SABS164-1:1992; ZA/3	2.5m	B50149-25M
Switzerland	10A/250VAC	SEV 1011-S24507	2.5m	B50137-25M
Taiwan	15A/127VAC	NEMA 5-15	4.4m	B50173-25M
United Kingdom	13A/250VAC	BS1363/A	2.5m	B50113-25M

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## Chapter 5

# Network and Telephone Line Planning

For information about planning network and telephone lines for your system, see:

- “Network Cable Requirements” on page 5-1
- “Telephone Line Requirements” on page 5-3

### Network Cable Requirements

U928 Four-Port T1/E1 PCI Adapters and Ethernet PCI adapters are typically supplied in pairs and teamed in software for fault tolerance. Each member of the pair requires cables.



#### WARNING

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**Make sure network cables can be routed out of the way of foot traffic.**

[Table 5-1](#) describes the cables you must supply for network connectivity. Be sure to provide cables of sufficient length for the distance between the system and a wall jack or hub.

#### NOTES

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1. Software upgrade services are available from [Stratus Professional Services](#). For a list of available services, see <http://www.stratus.com/services/ps/offerings.htm>.
2. If you have a unique network requirement, contact [Stratus Professional Services](#). For a list of available services, see <http://www.stratus.com/services/ps/offerings.htm>.
3. See the *Stratus ftServer Systems: PCI Adapter Guide* (R461) for more information about the adapters Stratus supplies for your ftServer system.

**Table 5-1. Customer-Supplied Ethernet Cables**

Component	Quantity	Cable
<p>10/100/1000-Mbps system Ethernet port</p> <p>Dual-port 10/100/1000Base-T Ethernet PCI Adapter (gigabit copper adapter for servers)</p>	<p>2 or 4</p> <p>2 for each pair of 10/100/1000Base-T Ethernet ports</p>	<p>24 AWG Unshielded Twisted Pair (UTP) EIA/TIA-Verified, Category-3 or Category-5 wire, with RJ-45 modular connectors terminated with pair-wiring adhering to the EIA/TIA 568-A or EIA/TIA 568-B standard.</p> <p>For connections to an Ethernet hub or switch, provide a straight-through cable.</p> <p>For 100- or 1000-Mbps (fast Ethernet) operation, provide full-duplex, or Category-5 Ethernet cables.</p> <p>The maximum allowable distance from an Ethernet port to a switch or a hub is 328 ft (100m) .</p>
<p>Dual-port 1000Base-SX Ethernet PCI Adapter (gigabit fiber-optic adapter for servers)</p>	<p>2 for each pair of 1000Base-SX Ethernet ports</p>	<p>Multimode, 62.5- or 50-micron, DUAL fiber cable with LC-type connectors to the PCI adapter, and connectors on the other end that are compatible with the network switch. The maximum distance between the U574 PCI adapter and a switch is 902 ft (275m).</p>
<p>U928 Four-Port T1/E1 PCI Adapter</p>	<p>2 for each pair of ports you will you</p>	<p>Standard category 5 cable with T1/E1/J1 pin-outs through RJ-48C connectors to connect to a CSU/DSU</p> <p>The maximum length of the cable is 655 feet (approximately 200 meters) without a repeater.</p> <p>A G.703 75- to120-ohm adapter is required for a connection to an E1 circuit that requires a 75-ohm BNC termination. You can order this G.703 adapter from Stratus; its part number is B333.</p> <p>Loopback plugs for all configured ports not in use.</p> <p>See the <i>Stratus fitServer Systems: PCI Adapter Guide</i> (R461) for more information.</p>

## Telephone Line Requirements

Generally, two telephone lines are required to ensure technical support for your ftServer system:

- One telephone line for use when calling for service
- One analog telephone connection point for the ASN modem, if used

A 7-ft (2.13m) telephone cable, part number AW-B20245, is shipped with the modem assembly.

### NOTE \_\_\_\_\_

A dedicated phone line provides the most reliable service. ASN calls routed through a PBX might be slow due to the load on the PBX, or might not complete successfully because the calls can become disconnected. If you must use a PBX, do not route the telephone extension through a switchboard; instead, provide a direct-dial analog number.



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## Chapter 6

# Rack Configuration Planning

For information about planning a rack configuration, see:

- [“Using PDUs” on page 6-1](#)
- [“Determining PDU Requirements” on page 6-2](#)
- [“Sample PDU Usage Calculation” on page 6-4](#)

## Using PDUs

ftServer systems have two power receptacles. Correspondingly, two PDUs provide power to the receptacles.

Use of PDUs is optional unless you have a support agreement with Stratus. If you do have a support agreement with Stratus, use pairs of PDUs to provide AC power to systems and components in a cabinet **if six or more power cords would otherwise exit from the cabinet.**

The A-side (top) PDU provides power to:

- The A-side of each system
- A rack-mounted LCD monitor unit
- A storage enclosure
- Any rack-mounted tape drives

The B-side (bottom) PDU provides power to the other side of each system and to the second side of a storage enclosure.

Because the A-side PDU always uses at least as many power cords and consumes at least as much power as the B-side PDU, plan the cabinet configuration so that the A-side PDU can support the configuration.

NOTES \_\_\_\_\_

1. Connect each PDU to a separate AC power source.
2. Install a maximum of two pairs of PDUs in a rack.

Use the information in “[Determining PDU Requirements](#)” on page 6-2 to plan the rack configuration for your ftServer system. “[Sample PDU Usage Calculation](#)” on page 6-4 shows how to use the information you gather for planning the rack configuration.

## Determining PDU Requirements

Using the nominal voltage rating of the power receptacle at your site and the total wattage of the components that will draw power from the A-side PDU, complete the information in Tables 6-1 and 6-2. This information will help you determine the current that the ftServer systems and rack-mounted components will draw and whether you need a second pair of PDUs.

### To complete Table 6-1

1. Obtain the voltage available at your location. Consult a facilities manager at your site to make sure you know the correct voltage.
2. For each type of component you plan to place in the rack, calculate the required current, as follows: Divide the wattage of the element, listed in the Watts column of [Table 6-1](#), by the voltage available at your site. Multiply the result by 1.25 and enter the value in the **Current** column.

**Table 6-1. Current and Rack-Space Requirements**

Component	Watts	Current	Rack Space
ftServer system	650		4U
1U LCD monitor unit†			1U
Tape-drive enclosure†			
Disk-storage enclosure†			

† See the *Stratus ftServer Systems: Peripherals Site Planning Guide (R582)* for the wattage and rack requirements of your monitor, tape drive, and disk-storage solutions.

**To complete Table 6-2**

1. In column 1, write the names of each system or component in the rack. If you have more than one system, use a row for each system.
2. In column 2, write the cumulative number of rack units (Us): Add the number of Us (see Table 6-1) for the component to the value in the space above and write the result.
3. In column 3, write the cumulative number of outlets required. For each component, add 1 to the value in the space above and write the result.
4. In column 4, write the cumulative current required. For each component, add the current for the component, which you entered in Table 6-1, to the value in the space above and write the result.

You need another pair of PDUs if the cumulative number of outlets exceeds 8 or if the cumulative current exceeds 15A. Use the information in column 2 to plan the size and number of racks required.

**Table 6-2. Calculating A-Side PDU and Rack-Space Requirements**

1. Component	2. Cumulative Space Used	3. Cumulative Number of Outlets	4. Cumulative Current (A)
PDU Pair	2U	0	0.00

## Sample PDU Usage Calculation

Table 6-3 shows how to use the information from Table 6-1 to calculate the current when the PDU is connected to a NEMA L6-20R receptacle in the United States, with a power voltage of 208V.

**Table 6-3. Sample: Current and Rack-Space Requirements**

Component	Watts	Current (A)	Rack Space
ftServer T65 AC system	650	3.91	4U
1U LCD monitor unit	54	0.12	1U
EC-SL1AA-YF tape drive enclosure	80	0.48	1U

Table 6-4 and the explanation which follows show how to use the information from Table 6-3 to determine when you need to buy an additional pair of PDUs or calculate the size and number of cabinets you need.

**Table 6-4. Sample: Calculating A-Side PDU and Rack-Space Requirements**

1. Component	2. Cumulative Space Used (U)	3. Cumulative Number of A-Side Outlets	4. Cumulative Current (A)
PDU pair	2	0	0.00
ftServer system	6	1	3.91
1U LCD monitor unit	7	2	4.23
Tape drive enclosure	8	3	4.71
ftServer system	12	4	8.62
ftServer system	16	5	12.52
PDU pair	18	0	0
ftServer system	22	1	3.91

In this calculation, components were added one by one, calculating:

- The total current demanded by the components
- The total space used in the rack
- The total number of outlets required

In this example, two PDUs can provide enough current for the LCD monitor unit, one tape drive enclosure, and three ftServer T40 AC or T65 AC systems. This set of components consumes 12.52 amperes; adding another system would increase the consumption to 16.43 amperes. The configuration also occupies five outlets in the PDU and 16U of rack space.

To add any more components, you require another pair of PDUs.



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# Appendix A

## System Specifications

### NOTES

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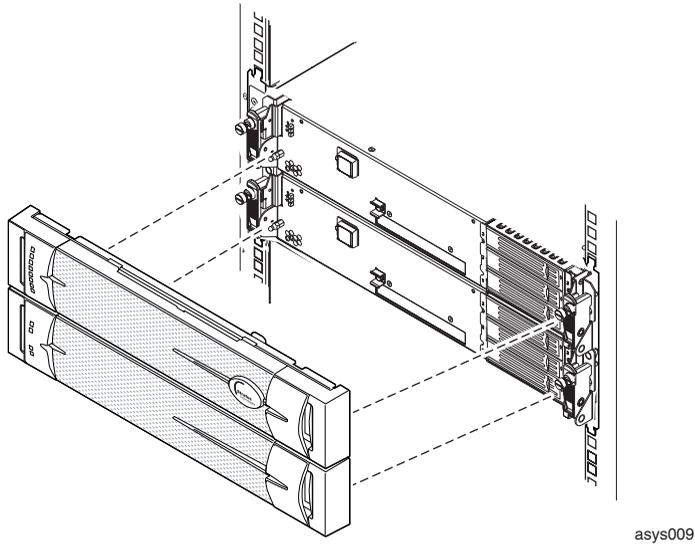
1. The system temperature and humidity requirements, defined in [Table A-2](#) and [Table A-1](#) are the **minimum** requirements the site must provide.
2. The temperature and humidity requirements for optional components are provided in the *Stratus ftServer Systems: Peripherals Site Planning Guide (R582)*.

The following figures show front and rear views of the systems.

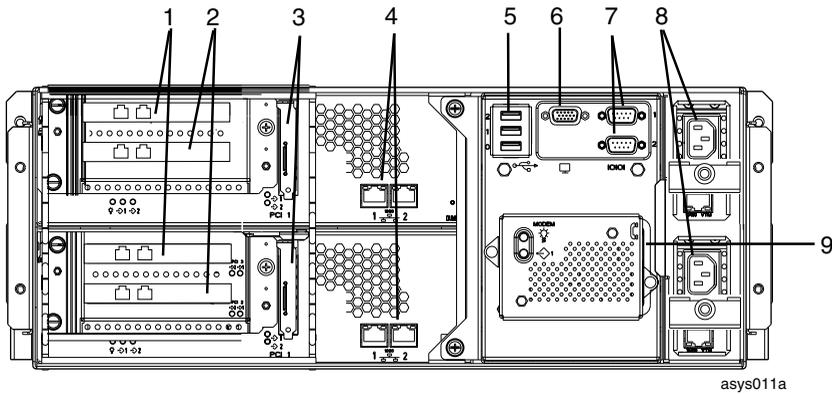
- [Figure A-1](#) shows the front of an ftServer T40 AC or T65 AC system, mounted in a rack with its bezel pulled forward.
- [Figure A-2](#) shows the rear of an ftServer T40 AC or T65 AC system, specifying the locations of the connectors at the rear of the system.

[Table A-1](#) lists the dimensions for the cabinets supplied by cabinets provide by Stratus. [Table A-2](#) lists the specifications for ftServer T40 AC and T65 AC systems.

**Figure A-1. ftServer T40 AC or T65 AC System - Front View**



**Figure A-2. ftServer T40 AC or T65 AC System - Rear View**



- |   |  |   |                             |
|---|--|---|-----------------------------|
| 1 | PCI slot 3                                 | 6 | VGA (monitor) port          |
| 2 | PCI slot 2                                 | 7 | Serial (COM) ports (2)      |
| 3 | PCI slot 1                                 | 8 | Power receptacles (2)       |
| 4 | System 10/100/1000-Mbps Ethernet ports (4) | 9 | Modem (telephone line) port |
| 5 | USB ports (3)                              |   |                             |

**Table A-1. Cabinet Dimensions**

<b>24U Shipping Container</b>	
Height (including pallet)	56 in. (1.42m)
Width	41 in. (1.04m)
Depth	53 in. (1.35m)
<b>38U Shipping Container</b>	
Height (including pallet)	79.75 in. (2.03m)
Width	41 in. (1.04m)
Depth	53 in. (1.35m)
<b>24U Cabinet</b>	
Height (including casters)	50 in. (1.27m)
Width	27.5 in. (70 cm)
Depth	41 in. (1.04m)
Weight, empty	275 lb (125 kg)
Weight, empty with pallet and shipping container	436 lb (197.8 kg)
<b>38U Cabinet</b>	
Height (including casters)	74 in. (1.9m)
Width	27.5 in. (70 cm)
Depth	41 in. (1.04m)
Weight, empty	344 lb (156 kg)
Weight, empty with pallet and shipping container	512 lb (232.2 kg)

**Table A-2. System Specifications**

<b>Power</b>	
Input power	A-side enclosure: 650W B-side enclosure: 650W
Nominal input voltage (AC)	100-230 volts +/- 10% 240VAC+ 6%/-10%; 50/60 Hz
Protective earth ground current	3.5 milliamperes maximum for each AC power cord
<b>Physical Dimensions</b>	
Height	7.0 in. (17.78 cm; 4U)
Width	17.50 in. (44.45 cm)
Depth	30 in. (76.2 cm), excluding screws and bezel
Weight, including 8 DIMMS, 4 processors, and 6 disks	Two enclosures: 110 lb (49.9 kg), fully loaded Rails and shelf unit: 13.8 lb (6.26 kg)
<b>Environmental</b>	
Operating temperature	41° F to 95° F (5° C to 35° C) For every 800 ft (243.8 m) above 2000 ft (609.6 m), lower the maximum operating temperature) by 1°C.
Storage temperature	-38° F to 140° F (-40° C to 60° C), vented
Operating altitude	0 ft to 10,000 ft (0m to 3,048m)
Maximum rate of temperature change during operation	50° F/hr (10° C/hr)
Relative humidity during operation	20% to 80% (noncondensing)
Relative humidity during storage	20% to 80%
Heat dissipation	4432 BTUs per hour
Air cleanliness	Meets ISO 14644-1 class 8 standards
<b>Features</b>	
Processors	T40AC: One or two Intel® Xeon® 3.2 GHz processors with Hyper-Threading Technology in each CPU-I/O enclosure T65 AC: Two Dual-Core Intel Xeon 2.8 GHz processors with Hyper-Threading Technology in each CPU-I/O enclosure

**Table A-2. System Specifications** *(Continued)*

Memory	Eight physical dual data rate (DDR) inline memory module (DIMM) slots in each CPU-I/O enclosure
Ports	Two 10/100/1000-Mbps Ethernet ports in each CPU-I/O enclosure  Two AC power connectors, one VGA port, two serial ports, and three USB ports
PCI slots	One low-profile PCI adapter slot and two full-height PCI adapter slots, each operating at 64-bits and 100 MHz, all user-configurable, in each CPU-I/O enclosure
Disk drives	Three Serial ATA (SATA) disk drives in each CPU-I/O enclosure



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# Appendix B

## Electrical Circuit and Wiring Information

For electrical circuit and wiring information that you need to provide to the contractor and/or facilities personnel responsible for wiring the power at the system installation site, see:

- [“Fault Protection Requirements” on page B-1](#)
- [“Grounding Considerations” on page B-1](#)
- [“Circuit Wiring Diagrams” on page B-2](#)
- [“Electrical Power Connectors” on page B-10](#)

### Fault Protection Requirements

Each enclosure in ftServer systems contains internal fault/overload current protection. However, the system relies on the power distribution system at your site for protection against potential faults in the power cords and the wiring in the system base.

- If you are using a pair of PDUs in the cabinet, use 30A or less circuit breakers in each power distribution branch that feeds the PDUs.
- To connect a single system to power, use 20A or less circuit breakers in each power distribution branch that feeds the systems.

### Grounding Considerations

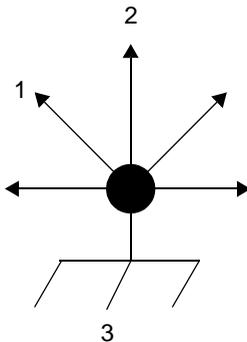
The system obtains an earth reference ground through the power cords attached to the system. Similarly, each peripheral device connected to the system obtains ground through its power cord. For each peripheral device, you **must** ensure that a high-integrity safety-ground conductor is installed as part of the wiring system (in accordance with U.S. national electric code NFPA 70 or the equivalent). The international safety standard (EN60950) for electronic data processing (EDP) equipment also requires a ground conductor, but calls it a protective earth (PE) ground.

Depending upon local conditions, ground potentials may differ between the system base and any peripheral devices connected to the system base. All grounds in the system **must** return to the same reference point in the power distribution system, as close as possible to **zero (0) volt potential** relative to earth reference ground. Earth

reference ground is typically a metal stake in the ground to which the ground conductors from one or more buildings are attached.

As shown in [Figure B-1](#), a *star ground* is often used to obtain the same earth reference ground. Each earth reference ground, such as the system base ground, is returned separately to a common point where a zero-volt (0V) earth ground exists. The star ground ensures that all equipment is at the same potential and that no noise or safety problems associated with an unpredictable or uncharacterized grounding system will occur.

**Figure B-1. Star Ground Example**



- 1 To monitor
- 2 To ftServer system
- 3 Earth reference ground (0V)

## Circuit Wiring Diagrams

For circuit-wiring information, see [“AC Circuit Wiring”](#) on page B-2.

### AC Circuit Wiring

The following circuit wiring diagrams show how the hot, ground, and/or neutral AC signals should be connected to the power input plug to the system and components:

- [Figure B-3](#) illustrates a single-phase 120-volts AC circuit connection.
- [Figure B-4](#) illustrates a single-phase 240-volts AC circuit connection.
- [Figure B-5](#) illustrates a split-phase 120/240-volts AC circuit connection.
- [Figure B-6](#) illustrates a three-phase 208-volts AC, Y-, or  $\Delta$ -source circuit connection, phase-to-neutral.

- [Figure B-7](#) illustrates a three-phase 208-volts AC, Y-, or  $\Delta$ -source circuit connection, phase-to-phase.
- [Figure B-8](#) illustrates a three-phase 380V AC, Y-, or  $\Delta$ -source circuit connection, phase-to-neutral.

In the diagrams in this appendix, the power inputs for ftServer T40 AC and T65 AC systems are labeled X and Y, as shown in [Figure B-2](#), to eliminate any ambiguities in the nomenclature. For single-phase applications, the X input is connected to the L (Line) *hot* input, and the Y input is connected to the N (Neutral) input. However, for split-phase or three-phase applications, the X and Y inputs are connected to L1, L2, or L3 (separate lines). Therefore, for split-phase or three-phase applications, both X and Y can be electrically hot with respect to the system base (earth reference ground). [Figure B-2](#) shows the physical locations of the X and Y inputs on the system base.

**Figure B-2. Power Input Labeling**

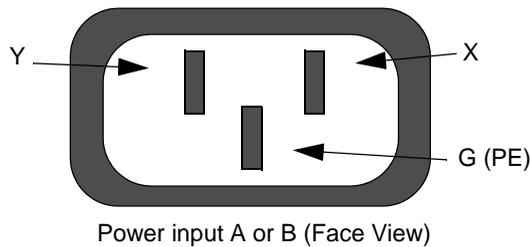


Figure B-3 shows a single-phase 120-volts AC circuit connection. Note that this application requires a single-pole circuit breaker.

**Figure B-3. Single-Phase 120-Volts AC Circuit Connection**

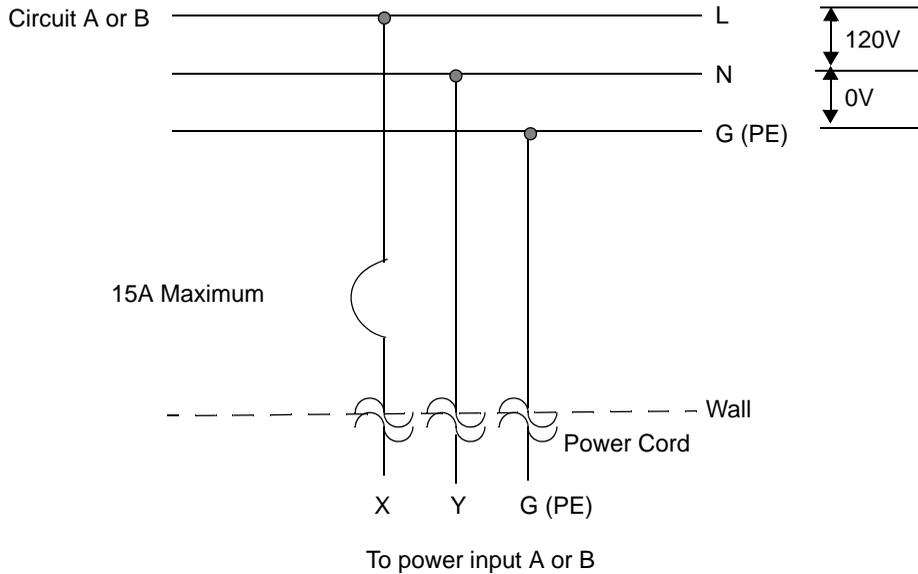


Figure B-4 shows a single-phase 240-volts AC circuit connection. Note that this application requires a single-pole circuit breaker.

**Figure B-4. Single-Phase 240-Volts AC Circuit Connection**

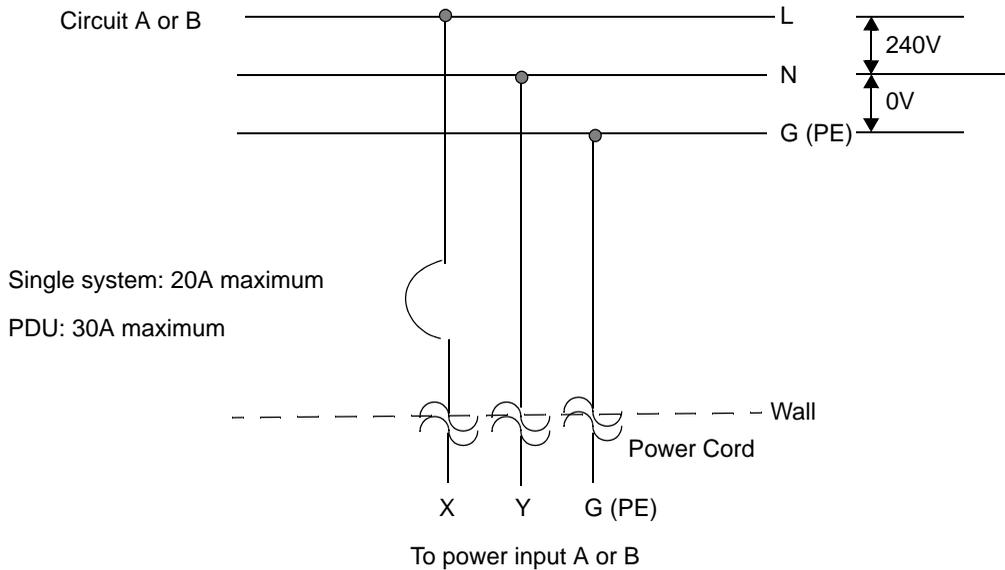


Figure B-5 shows a split-phase 120/240-volts AC circuit connection. Note that this application requires a double-pole circuit breaker.

Figure B-5. Split-Phase 120/240 Volts AC Circuit Connection

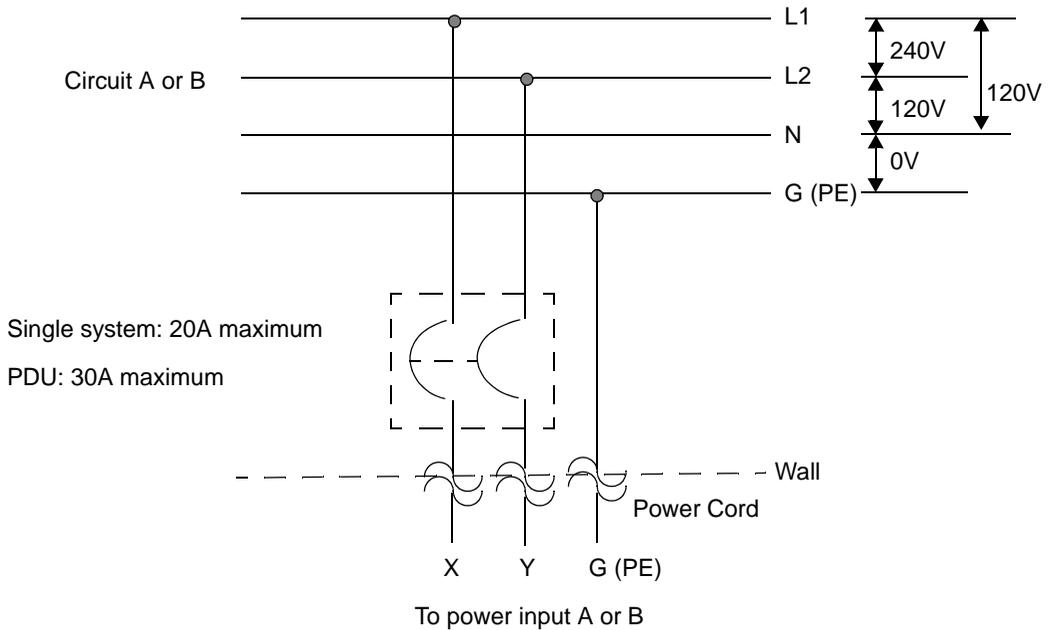


Figure B-6 shows a three-phase 208-volts AC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-neutral source connection. Note that the X input on the system can be connected from L1, L2, or L3. This application requires a single-pole circuit breaker.

**Figure B-6. Three-Phase 208-Volts AC, Y-, or  $\Delta$ -Source Circuit Connection, Phase-to-Neutral**

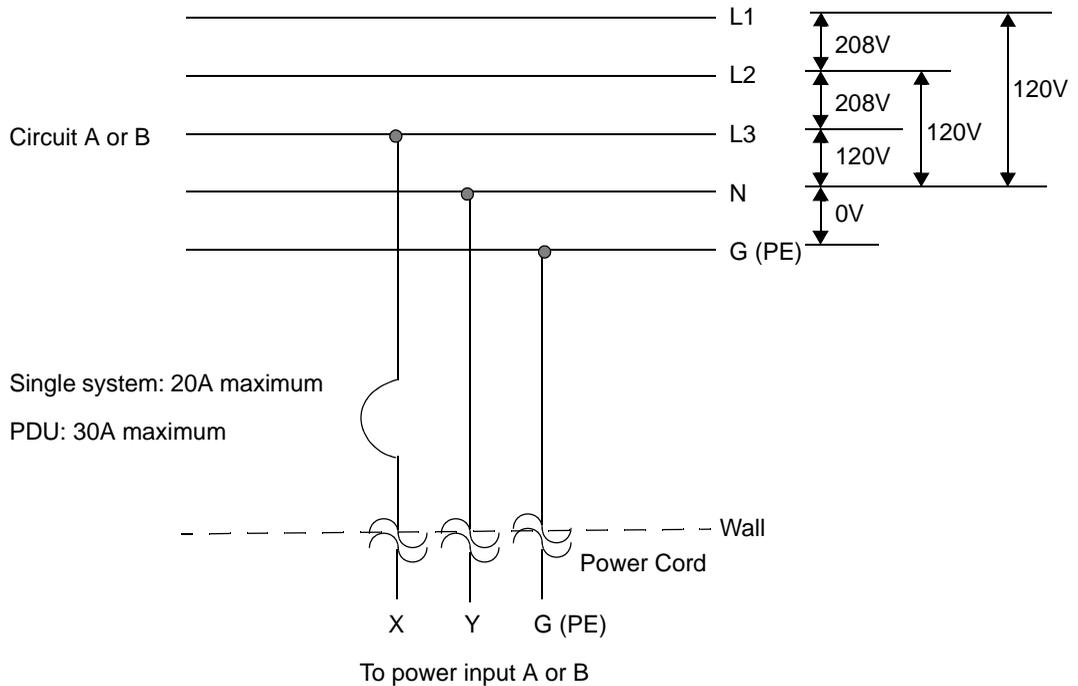


Figure B-7 shows a three-phase 208-volts AC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-phase source connection. Note that the X and Y inputs on the system can be connected from L1 and L2, L2 and L3, or L1 and L3. This application requires a double-pole circuit breaker.

**Figure B-7. Three-Phase 208-Volts AC, Y-, or D-Source Circuit Connection, Phase-to-Phase**

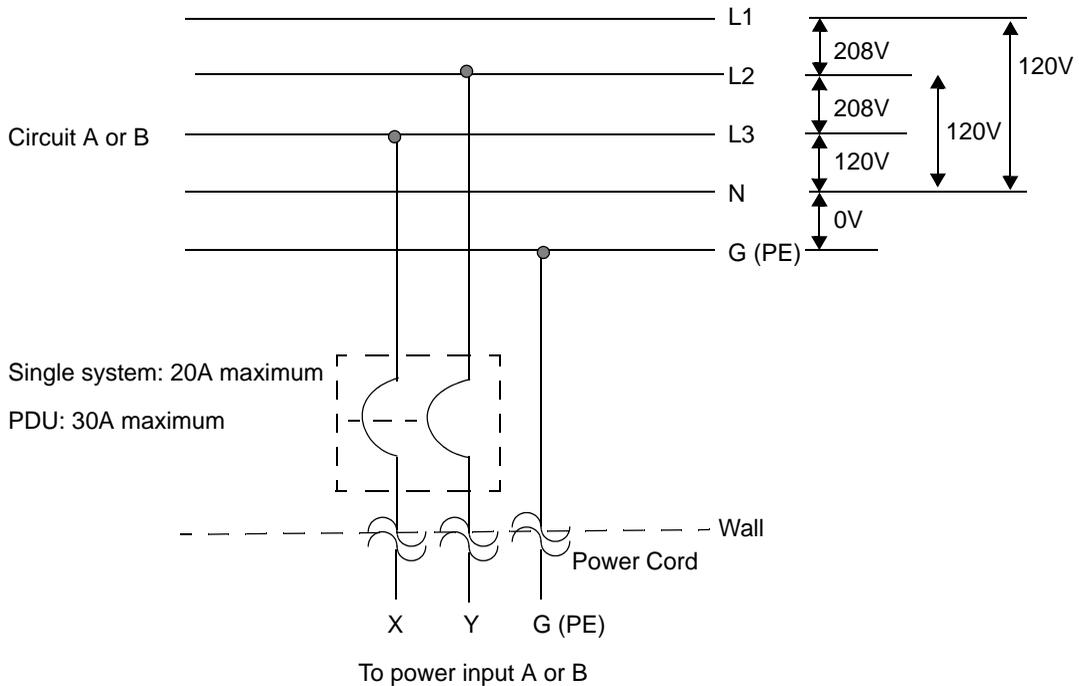
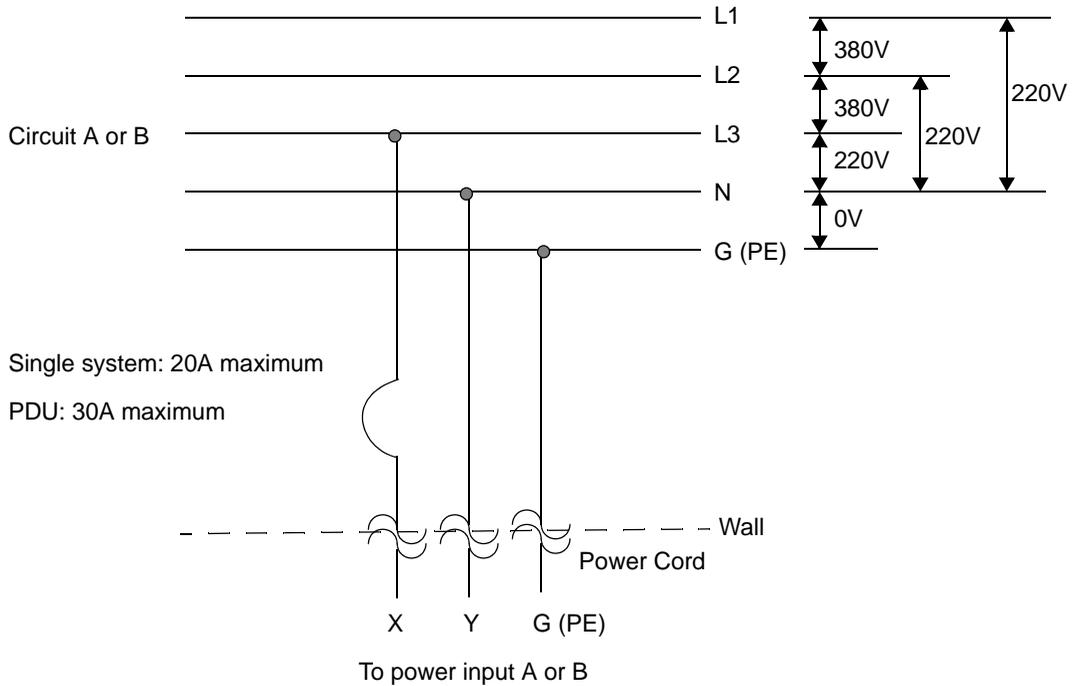


Figure B-8 shows a three-phase 380V AC, Y-, or  $\Delta$ -source circuit connection, which is a phase-to-neutral source connection. Note that the system's X input can be connected to L1, L2, or L3. This application requires a single-pole circuit breaker.

**Figure B-8. Three-Phase 380V AC, Y-, or  $\Delta$ -Source Circuit Connection, Phase-to-Neutral**



## Electrical Power Connectors

Table B-1 describes the connectors on the AC power cords that Stratus supplies for ftServer systems and optional devices, such as tape drives.

**Table B-1. Connectors for AC Power Outlets**

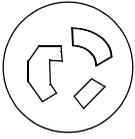
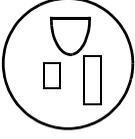
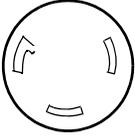
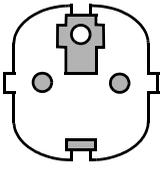
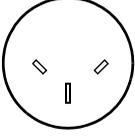
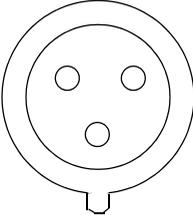
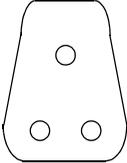
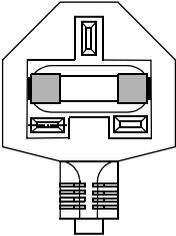
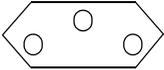
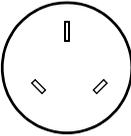
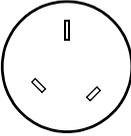
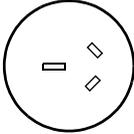
Connector	Configuration	Rating	Description
NEMA L6-20		20A, 250 volts AC	2-pole, 3-wire
NEMA 5-15		15A, 125 volts AC	2-pole, 3-wire
NEMA L6-30		30A, 250 volts AC	2-pole, 3-wire
CEE (7) VII		20A, 250 volts AC	2-pole, 3-wire
CEI-23-16		16A, 250 volts AC	2-pole, 3-wire
SI 32/1971		16A, 250 volts AC	2-pole, 3-wire

Table B-1. Connectors for AC Power Outlets (Continued)

Connector	Configuration	Rating	Description
IEC 60309 (formerly IEC 309)		16-20A, 250 volts AC	2-pole, 3-wire
SABS 164-1:1992		16A, 250 volts AC	2-pole, 3-wire
BS 1363/A		13A, 250 volts AC	2-pole, 3-wire
SEV 1011-S24507		10A, 250 volts AC	2-pole, 3-wire
AS/NZS 3112-1993		15A, 250 volts AC	2-pole, 3-wire
SAA/3/15 AS/NZS 3112-1993		15A, 250 volts AC	2-pole, 3-wire

**Table B-1. Connectors for AC Power Outlets** *(Continued)*

Connector	Configuration	Rating	Description
GB1002-1996		10A, 250 volts AC	2 pole, 3-wire

---

## Appendix C

# Standards Compliance

ftServer systems comply with the electromagnetic interference (EMI), immunity, safety, and noise regulations listed in Tables C-1 through C-4. All necessary agency labels are on the system.

### NOTES \_\_\_\_\_

1. This system must be configured with the components listed and described in the product configuration specifications. Deviations from this list of components will void agency certification.
2. You must install all wiring, including power and communications cables, in compliance with local and national electrical code (in the United States, national electrical code NFPA 70). In addition, you must use shielded communications cables to remain in compliance with Federal Communications Commission (FCC) and other international Electromagnetic compatibility (EMC) regulations.
3. All EMC emissions compliance tests are performed at a third-party certified test laboratory. You can obtain compliance reports for these tests from your Stratus account representative, who will contact the Product Compliance Group in the Stratus engineering organization.

**Table C-1. EMI Standards**

<b>Standard</b>	<b>Description</b>	<b>Country/Region</b>
FCC Part 15 Class A	Code of Federal Regulations 47 (1998) Class A	North America
EN 55022	Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment	European Union
AS/NZS 3548	Limits and methods of measurement of radio disturbance characteristics of Information Technology Equipment	Australia/New Zealand
CNS13438	Chinese National Standard 13438	Taiwan
VCCI Class A	Voluntary Control Council for Interference by Information Technology Equipment	Japan

**Table C-2. Immunity Standards**

<b>Standard</b>	<b>Description</b>	<b>Country/Region</b>
EN 50082-1	Generic Immunity Standard, Electromagnetic Compatibility, Residential, Commercial, and Light Industrial	European Union
EN 55024	Limits and methods of measurement of immunity characteristics of Information Technology Equipment	European Union

**Table C-3. Safety Standards**

<b>Standard</b>	<b>Description</b>	<b>Country/Region</b>
UL 60950	Safety of Information Technology Equipment	North America
EN 60950	Safety of Information Technology Equipment	European Union

**Table C-4. Noise Standards**

<b>Standard</b>	<b>Description</b>	<b>Country/Region</b>
ISO 9614-2	Acoustics. Determination of Sound Power Levels of Noise Source using Sound Intensity	European Union
ISO 7779	Measurements of Airborne Noise emitted by Computers and Business Equipment	European Union

**VCCI Note**

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

**BSMI Note****警告使用者**

這是甲類的資訊產品、在居住的環境中使用時、可能會造成射頻干擾、在這種情況下、使用者會被要求採取某些適當適對策



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